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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EVON LLEWELLYN CROOKS, JOANNE NAOMI TAYLOR,
and PAUL FISCHER BERNASEK

Appeal 2008-3763
Application 10/674,908
Technology Center 1700

Decided: September 9, 2008

Before BRADLEY R. GARRIS, MICHAEL P. COLAIANNI, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) (2002) from the Examiner's rejection of claims 1 and 3-20.[1] (Examiner's Answer entered Oct. 31, 2007, hereinafter "Ans."). We have jurisdiction pursuant to 35 U.S.C. § 6(b) (2002).

We AFFIRM.

THE INVENTION

Appellants' claimed invention is directed to a cigarette comprising a tobacco rod and a filter element. The filter element has an end proximal to the tobacco rod and an end distal from the tobacco rod. (Spec. 7, ll. 1-25, 18, ll. 14-22, Figs. 1 and 3). The filter element comprises two sections of fibrous tow material, a first longitudinally extending section and a second longitudinally extending section. (Spec. 15, ll. 16-25, 24, ll. 25-31, Fig. 3). The first and second sections are spaced apart and define a compartment. *Id.* The compartment contains a hollow region and an adsorbent material-containing region, separated by a semi-permeable barrier. (Spec. 18, ll. 14-22; 25, l. 25 - 26, l. 6, Fig. 3). Appellants also claim a semi-permeable membrane comprising paper or fibrous filter material as the barrier, and a granular adsorbent material. (Spec. 24, ll. 25-31, 16, ll. 10-18). Appellants state that the presently claimed filter element configuration provides reduction of certain gas phase components in mainstream smoke generated by the cigarette. (Spec. 2, ll. 27-30).

Claims 1, 15, 16, and 20, reproduced below, are representative of the subject matter on appeal.

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[1] Claim 2 has been cancelled. (Revised Appeal Brief filed Jul. 25, 2007, hereinafter "App. Br.," 2).

1. A cigarette comprising a tobacco rod and a filter element connected to the tobacco rod, said filter element having an end proximal to the tobacco rod and an end distal from the tobacco rod, wherein said filter element comprises:

a first longitudinally extending section of fibrous tow filter material positioned at the end of the filter element proximal to the tobacco rod;

a second longitudinally extending section of fibrous tow filter material positioned at the end of the filter element distal from the tobacco rod and spaced apart from said first section of filter material, the two sections of filter material defining a compartment therebetween by enclosing each end of said compartment;

a semi-permeable barrier dividing said compartment into a first region adjacent to said first section of filter material and a second region adjacent to said second section of filter material; and

an adsorbent material contained within said second region of said compartment, wherein said first region of said compartment is hollow.

15. The cigarette of Claim 1, wherein said adsorbent is activated carbon.

16. The cigarette of Claim 15, wherein the activated carbon has an activity of about 60 to about 150 Carbon Tetrachloride Activity.

20. A cigarette comprising a tobacco rod and a filter element connected to the tobacco rod, said filter element having an end proximal to the tobacco rod and an end distal from the tobacco rod, wherein said filter element comprises:

a first longitudinally extending section of fibrous tow filter material positioned at the end of the filter element proximal to the tobacco rod;

a second longitudinally extending section of fibrous tow filter material positioned at the end of the filter element distal from the tobacco rod and spaced apart from said first section of filter material, the two sections of filter material defining a

compartment therebetween by enclosing each end of said compartment; and

a semi-permeable membrane comprising paper or a fibrous filter material dividing said compartment into a first hollow region adjacent to said first section of filter material and a second region containing a granular adsorbent material adjacent to said second section of filter material.

THE REJECTIONS

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Counts	5,629,525	Dec. 2, 1997
Zhuang	6,814,786	Nov. 9, 2004 (Apr. 2, 2003)
Yang	200410226569	Nov. 18, 2004 (Feb. 22, 2002)

Henning, K.D., Degel, J. "Purification of air, water and off gas-solvent recovery", March1990
Keith, C.H., "Tobacco Smoke filtration" 1970 (est.) Bates 2501 260096-2501 2601 30.

Two grounds of rejection under 35 U.S.C. § 103(a) are at issue. First, claims 1, 3-15, and 17-20 stand rejected as being unpatentable over Counts in view of Zhuang, Yang, and further in view of Keith. Second, claim 16 stands rejected as being unpatentable over Counts, Zhuang, Yang, and Keith, and further in view of Degel.

The Examiner found that Counts discloses the presently claimed filter element except for the first and second longitudinally extending sections of fibrous tow and a compartment having an absorbent section and a hollow section. (Ans. 5). The Examiner found that Counts teaches a tubular free flow filter element and a tubular free flow filter. (Ans. 4). The Examiner found that Zhuang teaches a filter having two sorbent segments that define a

mixing region, where the mixing region increases gas recombination for enhanced selective filtration. (Ans. 5 and 6). The Examiner also found that Yang teaches granulated flavored active carbon that imparts a desired taste and removes one or more components from mainstream smoke. (Ans. 6). The Examiner found that both Zhuang and Yang teach that the filter may be substituted in a portion of a tubular free-flow filter element, such as the free flow filter element in the cigarettes disclosed in Counts. (Ans. 6 and 7). The Examiner concluded that it would have been obvious to substitute the portion of the free flow filter element closest to the tobacco rod disclosed in Counts with the filter taught by Zhuang in order to increase the filtering selectivity of the filter. (Ans. 7-9). The Examiner also concluded that it would have been obvious to fill the remaining portion of the free flow filter element of Counts with the flavored components of Yang to selectively remove one or more components from and to add flavor to the mainstream smoke. *Id*. Thus, the Examiner found that the mixing region of Zhuang's filter element corresponds to the hollow region of Appellants' filter element, where the sorbent segment closest to the tobacco rod corresponds to the first longitudinally extending section, and the second sorbent material corresponds to the semi-permeable barrier. (Ans. 9). The Examiner also found that the portion of Counts' free-flow filter element filled with Yang's components corresponds to the second region filled with adsorbent material, and the mouthpiece filter plug in Counts corresponds to the second longitudinally extending section. *Id*.

Appellants acknowledge that both Zhuang and Yang refer to Counts as part of their disclosure, but contend there is nothing in the references to suggest the specific arrangement of elements relied on by the Examiner.

(App. Br. 4). Appellants argue that Zhuang and Yang provide no guidance in choosing between the large number of different possible arrangements that could result from combining the two references to arrive at the claimed filter element. (App. Br. 5-7, Reply Brief filed Dec. 21, 2007, hereinafter "Reply Br.," 2).

The Examiner additionally found that neither Counts nor Zhuang teaches a fibrous tow material for the first and second longitudinally extending sections of the filter element. (Ans. 10). The Examiner found that Keith teaches that cellulose acetate in the form of a tow is the most common filtering agent. (Ans. 10). As a result, the Examiner concluded that it would have been obvious to modify the filter of Counts in view of Zhuang and Yang with a cellulose acetate tow either alone or in combination with granulated activated carbon. (Ans. 11).

Appellants contend that Zhuang is directed to improving gas filtration and teaches that fibrous tows are unsuitable for gas filtration. (App. Br. 9). Accordingly, Appellants argue that one would not have been motivated to modify Zhuang's filter component with fibrous tow because the resulting filter would be unsuitable for gas filtration, thus negating the purpose of Zhuang's filter. (App. Br. 9 and 10, Reply Br. 3). Appellants also point to the specific sorbent materials including activated carbon, which Appellants argue is additional confirmation that one would not have used a fibrous tow in Zhuang's filter. (App. Br. 9). Appellants further argue that Zhuang refers to the sorbent materials as "monolithic," which does not include sorbent materials comprising fibrous materials. (Reply Br. 3 and 4). Appellants also argue that the Examiner's interpretation of Zhuang is inconsistent with the overall teachings of the reference. (Reply Br. 3).

Appellants further contend that the Specification contains evidence of unexpected results that would overcome any prima facie case of obviousness presented by the Examiner. (App. Br. 10). Specifically, Appellants argue that Example 4 shows a surprising improvement in the reduction of certain gas phase components over conventional cigarettes not containing a hollow section upstream of the adsorbent material. (App. Br. 10, Reply Br. 4).

Regarding claim 16, the Examiner found that Yang teaches specific surface areas for activated carbon, but does not specifically teach the claimed Carbon Tetrachloride Activity. (Ans. 13 and 14). The Examiner found that Degel teaches a positive relationship between surface area of activated carbon and Carbon Tetrachloride Activity. (Ans. 14). The Examiner concluded that it would have been obvious to one of ordinary skill in the art to optimize the surface area of the activated carbon, and thus the Carbon Tetrachloride Activity disclosed in Yang, in order to optimize the filtering performance of the filter. (Ans. 14). Appellants do not present any additional arguments regarding the rejection of claim 16, but rely on the arguments presented with respect to the first ground of rejection. (App. Br. 11).

ISSUES

We frame the issues before us as:

Have Appellants shown that the Examiner erred in finding that the claimed filter element would have been obvious to one of ordinary skill in the art over the cited prior art of record?

If a prima facie case of obviousness exists, have Appellants sufficiently demonstrated unexpected results to overcome the prima facie case?

We answer both questions in the negative.

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. Appellants' Figure 3 is reproduced below:

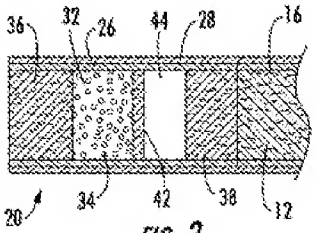

FIG. 3

Figure 3 depicts a filter element (20) including a semi-permeable barrier (42) that divides compartment (32) into two sections, a hollow section (44) and a section filled with adsorbent material (34). Figure 3 also depicts a tobacco rod (12) along with filter materials (36) and (38). (Spec. 14, ll. 14-31).

2. Appellants state in the Specification that the hollow section of the compartment "can provide a mixing region for the mainstream smoke prior to the entry of the smoke into the adsorbent material, which can contribute to vapor phase removal by the adsorbent…." (Spec. 18, ll. 19-22).
3. Example 1 of Appellants' Specification contains the filter element of the general configuration shown in Figure 2. (Spec. 26, ll. 3-4).
4. Appellants' Figure 2 is reproduced below:

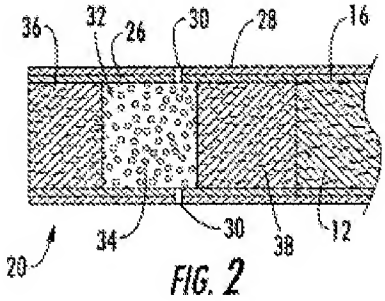

FIG. 2

Figure 2 depicts a filter element (20) according to Appellants' invention including a compartment (32) filled with adsorbent material (34). Figure 2 also depicts a tobacco rod (12) along with filter materials (36) and (38). (Spec. 17, ll. 12-21).

5. Example 4 of Appellants' Specification states that the filter element according to Figure 3 shows a reduction in formaldehyde, acetaldehyde, acetone, and acrolein when compared to the filter element of Example 1. (Spec. 28, ll. 12-30).

6. Figure 4A of Counts is reproduced below:

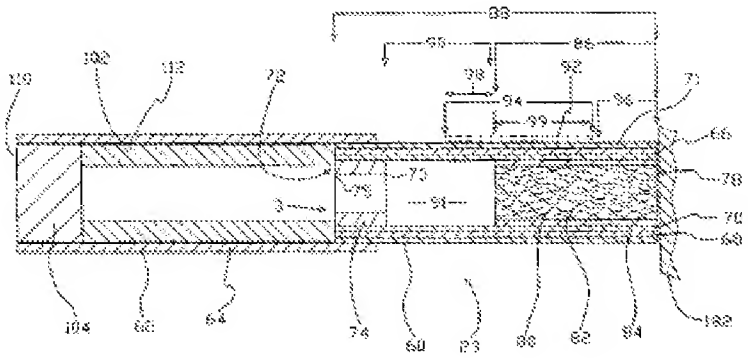

Figure 4A depicts a sectional view of a cigarette having a tobacco rod (60), tobacco plug (80), free flow filter (102), filter plug (104), free flow filter (74), and void (91). (Col. 10, l. 28 –col. 11, l. 25).

7. Zhuang states:

In another embodiment, the filter 30 is provided in the filter portion of an electrically heated cigarette for an electrical smoking device. See, for example, U.S. Pat. No. 5,692,525, which is hereby incorporated by reference in its entirety. (Col. 13, ll. 62-67).

8. Zhuang states that filter disclosed therein may be applied to a "part of" the tubular free-flow filter element, and exhibits a preference for the "tobacco side" in dual filter arrangements. (Col. 12, ll. 35-38, col. 14, ll. 15-20).

9. Zhuang states:

The invention provides filters suitable for gas filtration. A preferred embodiment of a filter comprises a sorbent including at least two sorbent segments, and a mixing region between two adjacent sorbent segments. The mixing region can be a space and/or it can include at least one mixing segment. The filter can remove at least one selected gas-phase constituent from a gas flow. (Col. 1, ll. 50-57).

10. Zhuang discloses that cellulose fibers in conventional filters are useful for removing particulate and condensable components and that activated carbon is useful for gas filtration. (Col. 1, ll. 15-19, 50-59).

11. Zhuang states:

The term "sorbent" as used herein refers to either an adsorbent, an absorbent, or a material that can function as both an adsorbent and an absorbent. (Col. 4, ll. 40-42).

12. Zhuang states:

The mixing region can be a space and/or it can include a mixing segment. The mixing region promotes mixing of gas that has passed through one monolithic sorbent segment, before the gas enters an adjacent sorbent segment. The mixing region can

increase gas recombination, thereby enhancing the filtration selectivity of the filter. (Col. 3, l. 65 - col. 4, l. 3).

13. Yang states:

The flavored carbon particles may be used in a variety of applications, including smoking articles, cut filler compositions and cigarette filters. Thus, in one embodiment, the invention relates to a smoking article comprising flavored carbon particles. The smoking article may be any article containing smokeable material, such as a cigarette, a pipe, a cigar and a non-traditional cigarette. Non-traditional cigarettes include, for example, cigarettes for electrical smoking systems as described in commonly-assigned U.S. Pat. Nos. 6,026,820; 5,988,176; 5,915,387; 5,692,526; 5,692,525; 5,666,976; and 5,499,636. ([0045]) (emphasis added).

14. Yang states:

The invention relates generally to treatment of carbon particles with a flavorant and use of flavored carbon as filtering material in smoking article. ([0002]).

15. Keith states:

It is for these reasons that most current filters are made from one or more of three materials, these being cellulose acetate fibers, cellulose fibers and granular activated carbon. Of these materials, cellulose acetate in the form of a tow or bundle of continuous filaments is by far the most common filtering agent. In this country, 91% of all cigarette filters produced were of the acetate type, 5% were of dual construction with an acetate tow segment combined with a cellulose, carbon, or mouthpiece segment, 3% were of two or three unit construction utilizing acetate and carbon alone or in combination in the various segments, and l% contained cellulose or cellulose plus carbon as components. (P. 2).

PRINCIPLES OF LAW

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007).

In *KSR*, the Court reaffirmed the elements of an obviousness analysis set out in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), namely: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; and (3) resolving the level of ordinary skill in the pertinent art. *KSR*, 127 S. Ct. at 1734. Secondary considerations such as commercial success, long felt but unsolved needs or failure of others "'might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.'" *Id.* (quoting *Graham*, 383 U.S. at 17-18).

However, the Court emphasized the need to account for common sense when considering whether a combination of references would have been obvious: "[c]ommon sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like the pieces of a puzzle." *Id.* at 1742. The Court further explained that "[a]lthough common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to

identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *Id.* at 1740-1741.

Regarding the use of hindsight, the Court indicated that a factfinder "must be cautious of arguments reliant upon *ex post* reasoning," but went on to state that "[r]igid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it." *Id.* at 1742-43.

ANALYSIS

Appellants do not argue the claims subject to each ground of rejection separately. Accordingly, we confine our discussion to appealed claim 1, which contains claim limitations representative of the arguments made by Appellants pursuant to 37 C.F.R. § 41.37(c)(1)(vii) (2006).

We are unpersuaded by Appellants' arguments that there is no motivation to combine Counts, Zhuang, and Yang. While *KSR* reaffirmed the teaching, suggestion, motivation test as one way of satisfying the elements of an obviousness analysis, *KSR* also emphasized that common sense is not to be ignored. *KSR*, 127 S. Ct. at 1742. Specifically, Appellants argue that there are many conceivable arrangements suggested by the prior art and no direction is given as to the particular arrangement set forth by the Examiner, such that the Examiner has relied on the use of Appellants' Specification to combine the prior art to arrive at the claimed invention. (Ans. 4-6). We do not find this argument persuasive. Both Zhuang and Yang identify the cigarettes of Counts as smoking devices to which their inventions may be applied. (*See* FF 6, 7 and 13). Further, Zhuang states that

the filter disclosed therein may be applied to a "part of" the tubular free-flow filter, and exhibits a preference for the "tobacco side" in dual filter arrangements. (FF 8). Thus, there is a sufficient reason provided in the references for arranging the components of Zhuang and Yang relative to each other in the tubular free-flow filter as determined by the Examiner.

Appellants argue that the Examiner's combination of references does not yield predictable results and that the prior art teaches away from the Examiner's combination. (Reply Br. 1). Specifically Appellants' contention that Zhuang teaches away from employing a fibrous tow as part of the sorbent material is not persuasive. (*See* App. Br. 10, Reply Br. 3). Zhuang discloses that cellulose fibers in conventional filters are useful for removing particulate and condensable components and that activated carbon is useful for gas filtration. (FF 10). Moreover, Keith teaches that filter materials may include cellulose plus carbon as components. (FF 15). Thus, one of ordinary skill in the art would have had a reason for combining a fibrous tow with activated carbon in order to obtain the advantages of both materials in the resulting filter element.

In addition, we are not persuaded by Appellants' argument that the term "monolithic" suggests that Zhuang does not intend to encompass fibrous tow materials. The Examiner finds that Zhuang does not exclude conventional fibrous tow materials because Zhuang teaches that the sorbent materials "comprise" activated carbon. (Ans. 20). We find nothing improper in the Examiner's finding, particularly where Zhuang defines sorbent as "either an adsorbent, an absorbent, or a material that can function as both an adsorbent and an absorbent." (FF 11). Thus, Zhuang's broad definition does not exclude fibrous tow from the sorbent material.

Appellants' argument that Example 4 presents surprising results that overcome the Examiner's prima facie case of obviousness is also not persuasive. In order to prove unexpected results, the invention must be compared with the closest prior art. *In re Payne*, 606 F.2d 303, 316 (CCPA 1979). Appellants have not demonstrated unexpected results with respect to the closest prior art. Example 1, against which the alleged improvements in gas phase removal are noted, does not contain a hollow section as set forth in Zhuang. (FF 3 and 4). In addition, Example 1 tests the filter element of Figure 2, which Appellants indicate as being according to their invention, and not the prior art. *Id.* Further, the record as a whole is unclear as to whether this improvement is due to an unexpected synergy, or is a result of the combination of an expected improvement in properties. *See In re Huellmantel*, 324 F.2d 998, 1003 (CCPA 1963). There is no evidence on the record that states that the results in Example 4 are unexpected. Example 4 notes an improvement in gas phase removal with respect to certain specific gases, but there is no indication that the results are surprising. (FF 1 and 5). Appellants state in the Specification that the hollow section of the compartment "can provide a mixing region for the mainstream smoke prior to the entry of the smoke into the adsorbent material, which can contribute to vapor phase removal by the adsorbent…." (FF 2). However, Zhuang also teaches that the mixing region of the filter may be a space, and that the mixing region increases gas recombination enhancing the filtration selectivity of the filter. (FF 12). Thus, both Zhuang and Appellants recognize the benefit of a space in the filter in order to improve gas phase removal. Therefore, we agree with the Examiner, that Appellants have not

presented sufficient unexpected results to overcome the Examiner's prima facie case of obviousness.

The Examiner's decision rejecting claims 1, 3-15, and 17-20 is affirmed.

Since Appellants do not separately argue the rejection of claim 16, we affirm the Examiner's decision rejecting this claim for the reasons addressed above.

CONCLUSION

In light of the above discussion, Appellants failed to demonstrate that the Examiner erred in rejecting claims 1, 3-15, and 17-20 under 35 U.S.C. § 103(a) as being unpatentable over Counts in view of Zhuang, Yang, and further in view of Keith and claim 16 as being unpatentable over Counts, Zhuang, Yang, and Keith, and further in view of Degel.

ORDER

The Examiner's decision rejecting claims 1 and 3-20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. §1.136(a)(1)(iv).

AFFIRMED

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